Motivating Young People Towards Success: Evaluation of a Motivational Interviewing-Integrated Treatment Programme for COD Clients in a Residential Therapeutic Community

Stefanie Klag, Frances O'Callaghan, Peter Creed and Melanie Zimmer-Gembeck

Abstract: The present study examined the effectiveness of Motivational Interviewing (MI) in the treatment of chronic substance users with high rates of comorbidity with mental health disorders (COD clients). Employing a quasi-experimental design to compare the effectiveness of standard drug and alcohol treatment with an MI-integrated approach, results revealed that the MI-integrated treatment approach was associated with improved retention in terms of keeping clients in the programme, a more autonomous motivational attitude towards treatment, and more positive and stronger treatment outcomes. These findings suggest that the MI-integrated approach was more effective in the treatment of COD clients compared to standard drug and alcohol treatment.

Introduction

Substance use amongst people with mental illness is one of the most significant problems facing the mental health system. Substance use exacerbates the symptoms of mental health conditions, resulting in more frequent hospitalisations and relapses, and higher rates of violent behaviour, suicide and homelessness (Bennett & Barnett 2003). Individuals with co-occurring mental health and substance use disorders (COD) are also more likely to engage in criminal behaviour resulting in incarceration (Wallace, Mullen & Burgess 2004), and have poorer treatment adherence and outcomes (Pages et al. 1998).

In light of these facts, intervening early and supporting the mental health of adolescents and young adults with COD is a research and policy priority in

Dr Stefanie Klag, PhD, BPsych (Hons), BA Japanese; Associate Professor Frances O'Callaghan, PhD, BArts; Professor Peter Creed, PhD, MApplied Psychology, BArts (Hons); and Associate Professor Melanie Zimmer-Gembeck, PhD, BA (Mathematics) are all based at the School of Psychology, Griffith University, Australia.
Email for correspondence: s.klag@griffith.edu.au

therapeutic communities, 30, 4, winter 2009

Australia and in other developed countries. Despite this priority, there remains little agreement about the most effective intervention strategies. Only recently have studies shown that integrated treatment approaches are most effective in treating and dealing with the large variety of problems that this population presents with (Schoener, Madeja, Henderson, Ondersma & Janisse 2006). One of these integrated approaches includes Motivational Interviewing (MI). There is evidence that integrated MI treatment improves general functioning and abstinence rates of COD clients (Martino, Carroll, O'Malley & Rounsaville 2000; Carey, Carey, Maisto & Purnine 2002; Martino, Carroll, Kostas, Perkins & Rounsaville 2002; Graeber, Moyers, Griffith, Guajardo & Tonigan 2003; Carroll 2004).

Motivational Interviewing

MI is a directive and client-centred approach for eliciting behaviour change by assisting clients to explore their goals and resolve any ambivalence and barriers associated with reaching them (Miller & Rollnick 2002). MI interventions generally begin with an assessment of the client's behaviour, its consequences, and the social and personal context of use, and are followed by personalised feedback. The clinical style incorporates strategies from client-centred therapy, such as displaying empathy, providing choice, removing barriers, providing feedback, and clarifying goals. MI also involves a particular interviewing style of asking open-ended questions, listening reflectively, affirming change-related participant statements and efforts, eliciting self-motivational statements with directive methods, and handling resistance without direct confrontation. Advice is provided in a way that challenges assumptions about norms and drug effects, but nevertheless leaves the ultimate decision making and responsibility for behaviour change with the client (Miller, Sovereign & Krege 1988). MI has the further advantages of being a brief and cost-effective means of improving client retention and treatment outcomes (Bien, Miller & Tonigan 1993; Vasilaki, Hosier & Cox 2006).

Treatment approach and setting

MI has been found to be more effective for reducing substance use than any treatment or comparison approaches (Dunn, Deroo & Rivara 2001; Burke, Arkowitz & Menchola 2003). Among adult samples, brief MI interventions have been associated with reduced alcohol use (Project MATCH Research Group 1997) and reduced drug use when compared to detoxification only conditions (Stotts, Schmitz, Rhoades & Grabowski 2001). Among adolescents, brief MI interventions have been associated with reduced substance use and associated problems, and increased treatment engagement (Tevyaw & Monti 2004) and reduced alcohol-related risk compared to standard care (Monti et al. 1999). However, several rigorous evaluations have compared MI with standard care in large samples of drug-using individuals and found few significant differences between MI treatment and other approaches (Donovan, Rosengren, Downey,

Cox & Sloan 2001; Miller, Moyers, Ernst & Amrhein 2003). The approach used in the bulk of these studies involved adding one additional MI session to standard treatment. The recommended approach, however, is to integrate MI techniques into standard treatment, rather than offering MI as a separate component. MI is anticipated to be more effective when integrated into standard clinical treatment in this way, but no previous treatment trial has taken this approach. The current study fills this identified gap in the literature (Dunn et al. 2001) by integrating MI into standard treatment and comparing the effectiveness of this treatment approach with standard treatment alone in a complex, heterogeneous and often treatment-resistant population. The setting for this study was a therapeutic community (TC) and the comparison treatment was standard TC care. MI was integrated into TC standard care and was compared to TC care without MI.

The TC is a treatment modality with a unique psychosocial approach that aims to integrate the client as a drug-free and productive individual into society (De Leon 1999). Although there is a large variety of programmes operating under the TC classification, they tend to share a similar structure, purpose, and view of rehabilitation that differentiates the TC from other treatment modalities. First, the underlying philosophy of TCs is that substance abuse is a disease of the whole person (Nielsen & Scarpitti 1997). Thus, drugs are viewed as part of the problem, not the problem itself (Lloyd & O'Callaghan 1999). Second, TC programmes incorporate a large range of interventions and services (e.g. individual and group therapy, vocational counselling, family therapy, medical and educational services) in an effort to treat the person in a holistic fashion (De Leon 1999). Finally, a unique aspect of the TC involves the 'community as a method', which refers to the use of a peer community that resembles a miniature society and consists of staff and TC clients in recovery. Within the safe environment of the community, individuals interact in structured and unstructured ways, with all TC activities designed to produce social and psychological change.

The present study

Little research has examined the effectiveness of MI-integrated techniques among substance-abusing populations with high rates of comorbidity. The present research addressed this omission by evaluating treatment outcomes resulting from the implementation of an integrated MI approach in comparison to standard treatment of young chronic substance users with comorbid mental health problems. Standard treatment was distinguished from the MI-integrated approach in that therapists in the latter treatment method attended a two-day MI workshop that was followed by supervision to further build and reinforce their MI skills. Following this training, therapists used their MI skills and strategies (e.g. expressing empathy, developing discrepancy, rolling with resistance and avoiding arguments, and supporting self-efficacy) throughout the entire treatment process, but particularly at the start of treatment, in an effort to motivate their clients and to promote the exploration of ambivalence

and resistance to change, to identify problem areas and solutions, and to facilitate the planning and instigation of change efforts.

A quasi-experimental design (comparison group = standard treatment; treatment group = MI-integrated treatment) was employed to compare the effects on participants' retention, motivation, and treatment outcomes of MI-integrated treatment versus standard TC treatment. Data for the comparison group was collected before therapists were formally trained in the administration of MI strategies and principles, and data for the treatment condition were collected at the end of the training period. Therapists' training involved participation in a two-day MI workshop which was followed by four monthly supervision and feedback sessions that were designed to facilitate clinicians' acquisition and use of MI.

There were four hypotheses.

1. Significantly more participants will be maintained through the initial stage of treatment in the integrated MI treatment compared to standard treatment.
2. Significantly more participants will be maintained to treatment graduation in the integrated MI treatment compared to standard treatment.
3. Participants' motivation for treatment will become more internalised/intrinsic over time in the MI-integrated intervention compared to standard treatment.
4. Participants in the MI-integrated treatment will show greater improvements in all outcome measures compared to standard treatment.

Method

Participants

Participants were individuals who sought residential treatment for their substance use problem at a TC on the Gold Coast, Australia. All new admissions were invited to take part in the study. To be eligible, participants were required to be 18 years of age. As TC clientele are sometimes under temporary physical and mental duress due to detoxification regimes, participants were screened for psychological distress by trained TC staff. Those individuals deemed too distressed to complete the assessment were not eligible to participate.

Comparison Group (N=29). Twenty-two participants (76%) of the comparison group were male and seven (24%) were female, with an average age of 24.2 years (SD=3.9). Most (N=23; 79.3%) of the twenty-nine comparison participants were poly-drug users (used three or more types of drugs), with cannabis, amphetamines and alcohol reported as the main drugs of choice. The majority of participants (N=26; 89.7%) had a dual diagnosis with multiple comorbid conditions including depression, bipolar, post-traumatic stress disorder, anorexia/bulimia, attention deficit hyperactivity disorder, oppositional defiant disorder and anxiety disorder. Comparison participants stayed in treatment for an average of 89.2 days (SD=68.4). Of the twenty-nine participants in the comparison

group, twenty-five (86.2%) dropped out of treatment and four (13.8%) graduated from the programme.

Treatment Group (N=32). Participants in the treatment group (19 males; 13 females) had an average age of 25.1 years (SD=3.2). Twenty-six (81.3%) were poly-drug users, with cannabis, amphetamines, alcohol and opiates reported as the main drugs of choice. The majority of participants (N=27; 84.4%) had a dual diagnosis with multiple comorbid conditions including depression, bipolar, social phobia, attention deficit hyperactivity disorder, anxiety and borderline personality disorder. Treatment participants stayed in treatment for an average of 105.1 days (SD=72.7). Of the thirty-two participants in the treatment group, twenty-three (71.9%) dropped out of treatment and nine (28.1%) graduated from the programme.

Treatment outcome measures

Table 1 shows the means, standard deviations and Cronbach alpha values for the scales used in Study 1.

Severity of Substance Dependence. No standard measure of dependence severity was available to assess the extent and strength of substance dependence for individuals undergoing residential drug treatment in a drug-free setting. Therefore, we used six items based on the Leeds Dependence Questionnaire (Raistrick et al. 1994) and the Severity of Dependence Scale (Gossop et al. 1995). The scale has been shown to be a reliable and valid measure of the dependence construct (see Klag 2006). We labelled this new instrument the Severity of Dependence Index. Items included, 'In the last week, how often have you thought about having drugs/alcohol?' and 'In the last week, how often have you felt that your need to take drugs/alcohol was too strong to control?' The items were scored on a five-point Likert scale ranging from 1 (*never*) to 5 (*always*).

Psychological Wellbeing. The widely-used 12-item version of the General Health Questionnaire (GHQ; Goldberg 1978) was employed as a measure of psychological wellbeing. The GHQ is a reliable and valid measure of psychological wellbeing (Goldberg & Williams 1988). Participants were asked how they had felt over the past week on a range of variables, such as cognitive processing, anxiety, and depression. Sample items included: 'Have you been able to enjoy your normal day-to-day activities?' and 'Have you been able to face up to your problems?' A four-point scale was employed with a response format ranging from 1 to 4. Anchors used included *better than usual/same as usual/ less than usual/much more than usual.* The scale was reverse scored with higher scores indicating greater psychological wellbeing.

Table 1: Means and standard deviations for the comparison and treatment group at Time 1, Time 2 and Time 3 of Study 1 data; Cronbach alpha values at Time 1, Time 2 and Time 3 of Study 1 data **(note that values are based on the combined data of the comparison and treatment group)**

	Comparison Group *N*=29 (T1); *N*=14 (T2); *N*=3 (T3)		Treatment Group *N*=32 (T1); *N*=15 (T2); *N*=8 (T3)		Cronbach's Alpha *N*=61 (T1); *N*=29 (T2); *N*=11 (T3)
	Mean	SD	Mean	SD	
Severity of Dependence Time 1	17.55	7.13	16.75	5.35	.89
Severity of Dependence Time 2	13.50	5.15	11.86	4.53	.88
Severity of Dependence Time 3	13.33	6.50	12.25	4.94	.90
Wellbeing Time 1	32.83	8.15	34.22	7.08	.89
Wellbeing Time 2	39.57	6.02	37.46	7.71	.90
Wellbeing Time 3	35.66	11.01	36.50	8.15	.93
Drug Taking Confidence Time 1	24.55	8.40	22.78	9.64	.91
Drug Taking Confidence Time 2	30.57	8.07	29.26	7.70	.92
Drug Taking Confidence Time 3	32.00	8.00	33.25	3.73	.73
Counsellor Rapport Time 1	52.00	10.31	49.61	8.51	.94
Counsellor Rapport Time 2	54.71	7.77	56.06	6.30	.90
Counsellor Rapport Time 3	58.33	4.93	60.62	6.52	.94
Social Integration - Belief subscale Time 1	16.89	3.46	16.09	4.13	.72
Social Integration - Belief subscale Time 2	16.21	2.11	17.53	2.79	.54
Social Integration - Belief subscale Time 3	14.33	1.15	18.25	2.54	.74
Social Integration - Criminal Peers Time 1	9.37	3.38	9.50	3.22	.84
Social Integration - Criminal Peers Time 2	8.42	2.70	11.33	2.19	.81
Social Integration - Criminal Peers Time 3	10.33	2.51	13.00	3.11	.85
Social Self-Efficacy Time 1	21.51	4.17	20.71	5.21	.79
Social Self-Efficacy Time 2	19.14	3.50	19.60	3.75	.80
Social Self-Efficacy Time 3	17.33	2.08	21.50	4.40	.82

cont'd/...

.../Table 1 cont'd

	Comparison Group N=29 (T1); N=14 (T2); N=3 (T3)		Treatment Group N=32 (T1); N=15 (T2); N=8 (T3)		Cronbach's Alpha N=61 (T1); N=29 (T2); N=11 (T3)
	Mean	SD	Mean	SD	
Meaning of Life - Harmony & Peace subscale Time 1	5.85	2.01	5.81	2.23	.75
Meaning of Life - Harmony & Peace subscale Time 2	7.50	1.87	7.53	2.13	.93
Meaning of Life - Harmony & Peace subscale Time 3	6.66	1.52	7.50	1.07	.72
Meaning of Life - Life Perspective, Purpose & Goal subscale Time 1	25.96	6.49	24.96	5.64	.91
Meaning of Life - Life Perspective, Purpose & Goal subscale Time 2	30.14	5.27	29.33	4.42	.90
Meaning of Life - Life Perspective, Purpose & Goal subscale Time 3	32.66	3.21	31.75	4.09	.87
Meaning of Life - Confusion & Lessened Meaning subscale Time 1	18.55	5.99	19.78	6.22	.80
Meaning of Life - Confusion & Lessened Meaning subscale Time 2	13.43	4.83	13.13	4.32	.80
Meaning of Life - Confusion & Lessened Meaning subscale Time 3	25.67	8.50	30.62	4.89	.88
Meaning of Life - Benefits of Spirituality subscale Time 1	8.59	3.79	8.75	3.55	.89
Meaning of Life - Benefits of Spirituality subscale Time 2	10.57	3.29	11.40	3.25	.89
Meaning of Life - Benefits of Spirituality subscale Time 3	11.33	4.72	11.25	4.06	.96
Goal Orientation - Learning GO subscale Time 1	29.85	5.65	32.03	4.83	.84
Goal Orientation - Learning GO subscale Time 2	35.78	6.23	40.00	4.10	.90
Goal Orientation - Learning GO subscale Time 3	34.00	4.58	41.25	3.01	.88
Goal Orientation - Performance GO subscale Time 1	13.70	2.96	13.77	2.98	.65
Goal Orientation - Performance GO subscale Time 2	13.93	3.29	13.26	3.75	.80
Goal Orientation - Performance GO subscale Time 3	26.33	2.51	19.37	3.50	.63
Goal Orientation - Avoidance GO subscale Time 1	16.89	4.50	16.61	5.14	.79
Goal Orientation - Avoidance GO subscale Time 2	15.14	4.67	13.60	4.64	.80
Goal Orientation - Avoidance GO subscale Time 3	18.00	4.58	11.62	3.16	.70

Treatment Motivation. The *Client Motivation for Therapy Scale* (Pelletier, Tuson & Haddad 1997) was utilised to assess levels of psychological internalisation of reasons for engaging in treatment. The scale distinguishes between six types of motivation (i.e. intrinsic, integrated, identified, introjected, external regulation, and amotivation), each measured by four items. Sample items included, 'I am in treatment for the pleasure I experience when I feel completely absorbed in a therapy session' (intrinsic), 'I am in treatment because through therapy I've come to see a way that I can continue to approach different aspects of my life' (integrated), 'I am in treatment because I would like to make changes to my current situation' (identified), 'I am in treatment because I would feel guilty if I was not doing anything about my substance abuse problem' (introjected), 'I am in treatment because other people think that it's a good idea' (external regulation), and 'Honestly, I cannot understand what I can get from treatment' (amotivation). Items were scored using a five-point Likert scale (1 = *does not explain it at all*; 5 = *explains it exactly*). Past research has supported the factor structure of the instrument, and has shown it to be a valid and reliable measure (alpha values ranging between .70 and .92; Pelletier et al. 1997) of the self-determination continuum. In order to improve the internal consistency of the scale, one item was removed from the identified motivation scale and two items from the introjected motivation scale.

Drug Taking Confidence. An 8-item version (Sklar & Turner 1999) of the 50-item *Drug Taking Confidence Questionnaire* (Annis & Martin 1985) was utilised to assess respondents' levels of self-efficacy regarding their ability to remain drug/alcohol-free when exposed to high-risk situations. A response format from 1 to 5 was chosen (1=*not at all confident*; 5=*very confident*) and sample items included: '*I am confident that I would be able to resist the urge to* use drugs/drink heavily if I were angry at the way things had turned out', and, 'I am confident that I would be able to resist the urge to use drugs/drink heavily if other people treated me unfairly or interfered with my plans'. The scale has been shown to be internally reliable (α=.89), and evidence in support of the construct validity of the scale has been provided (Sklar & Turner 1999).

Counselling Rapport. The 13-item Counselling Rapport scale (Joe, Broome, Rowan-Szal & Simpson 2002) was employed to measure clients' rapport and feelings about their individual counsellors. A response format from 1 to 5 was chosen (1=*not at all confident*; 5=*very confident*), and sample items included: 'You trust your counsellor', and 'You are motivated and encouraged by your counsellor'. Past research has provided evidence for the internal consistency of the scale, as indicated by Cronbach's alpha values above .90 (Joe et al. 2002; Simpson 2004).

Social Integration. The 26-item Social Integration Scale (Ross & Strauss 1997) was used to assess changes in perceptions of social integration across the therapeutic process. The scale consists of five subscales: (a) belief - belief in law and social control, (b) criminal peers - association with persons engaged in criminal behaviour, (c) network availability - interaction with non-criminal persons and organisations, (d) commitment - psychological investment in conventional behaviour, and (e) involvement - behavioural investment in conventional behaviour.

A response format from 1 to 5 was chosen (1=*strongly agree it is like me*; 5=*strongly disagree it is like me*) and sample items included statements such as: 'I always appreciate hearing about a good con' (belief), 'I have goals in life that I try to reach' (commitment), 'I spend a lot of time with my family' (involvement), 'I share my thoughts with a friend' (network availability), and 'I have friends that have committed crimes' (criminal peers). Research has provided support for the factor structure and reliability of the scale with reliability coefficients ranging from .61 to .81 (Ross & Straus 1997). In the present study, Cronbach alpha values for the network availability, commitment and involvement subscales were unacceptably low, ranging from .22 to .64. The three subscales were consequently removed from the analysis.

Social Self-Efficacy. The 8-item Social Self-Efficacy Scale (Sherer et al. 1982) was employed to assess participants' confidence in social interactions. Sample items included, 'I do not handle myself well in social situations', and 'It is difficult for me to make new friends'. Items were scored on a 4-point Likert scale (1=*never*; 4=*always*).

Meaning of Life. Jim, Purnell, Richardson, Golden-Kreutz and Andersen's (2006) 21-item, 4-component scale (i.e. Harmony and Peace; Life Perspective, Purpose and Goals; Confusion and Lessened Meaning; and Benefits of Spirituality) was utilised to assess how meaningful clients perceived their lives. Sample items included, 'I feel a sense of harmony within myself' (Harmony and Peace), 'I am more fulfilled and satisfied with my life' (Life Perspective, Purpose, and Goal), 'Life has less meaning' (Confusion and Lessened Meaning), and 'I find strength in my faith and spiritual beliefs' (Benefits of Spirituality). Each item was scored using a 5-point Likert scale (1=*strongly disagree*; 5=*strongly agree*). The scale has been validated in a number of studies and has been found to have reliability coefficients of around .90 for the total scale and between .84 and .90 for each of the four subscales. In order to improve the internal consistency of the Harmony and Peace subscale in the present study, two items were removed.

Goal Orientation. Based on scales by Button, Mathieu and Zajac (1996) and VandeWalle (2001), we designed a 23-item and 3-component goal orientation scale (i.e. learning – nine items, performance – seven items, and avoidance goal orientation – seven items) for use in a residential substance abuse treatment setting to measure participants' dispositions to pursue a learning goal orientation, performance or avoidance goal orientations in treatment. A learning goal orientation (LGO) relates to individuals' motivation to increase their competence, learn something new and to master challenging situations. Individuals assume a mastery-oriented response, which involves welcoming and finding solutions to challenging situations, remaining positive and maintaining striving when faced with difficult situations. In contrast, a performance goal orientation (PGO) refers to individuals' motivation to establish the adequacy of their ability in the eyes of others and to avoid situations where they may appear inadequate. A PGO is associated with a helpless response pattern with individuals avoiding and withdrawing from challenging situations. Finally, people with an avoidance goal orientation (AGO) focus on ways of avoiding negation of one's competence as well as unfavourable judgements by others. Sample items

included 'I like challenging and difficult situations in therapy because I learn a great deal' (learning), 'It's important that others think that I am doing well in therapy' (performance), and 'I would rather drop out of therapy than reveal unfavourable things about myself to other people' (avoidance). In order to improve the internal consistency of the measure, three items were removed from the performance dimension and one item from the avoidance dimension. Reliability analysis provided support for the internal consistency of the scale: LGO (α=.84), PGO (α=.69), and AGO (α=.79).

Procedure

Data were collected in three waves over a one-and-a-half year period. T1 (Time 1) data were collected within two weeks of admission to the TC, and T2 (Time 2) data two months after entering treatment. Given the intensity of TC treatment programmes, two months was considered sufficient time for psychological, cognitive, and behavioural changes to occur. The third and final set of data (Time 3 – T3) was collected shortly prior to clients' graduation from the treatment programme.

With regard to the data collection procedure, on a fortnightly basis an announcement was made by a staff member of the TC for all new admissions, who were deemed psychologically stable enough to complete the assessment pack, to gather in a designated room. Individuals who volunteered to participate in the research were asked to read through an information sheet and sign a consent form, while those who decided not to take part were asked to leave the room. The participants were handed a copy of the questionnaire and asked to answer all questions as honestly as possible and without discussing their answers with other clients. Upon completion of the questionnaire, participants were asked to take a few minutes to read through the questionnaire to ensure that all items had been completed in order to avoid problems with missing data. As a sign of appreciation for their participation, all clients received a small chocolate while completing the survey.

At T2, a staff member of the TC asked those clients who had completed the T1 assessment to gather in a designated room. Again, respondents were handed a copy of the questionnaire and asked to answer all questions as honestly as possible without discussing their answers with other participants, and to check the completed survey for uncompleted items before handing it back to the moderator.

For the collection of T3 data, a designated staff member of the TC notified the moderator of participants' graduation dates. Taking time and resource constraints into consideration, wherever possible the moderator conducted the data collection process in person, following the procedures for questionnaire completion outlined above. In cases where the data could not be collected in person, the questionnaire was mailed to the respondent with clear instructions of how to complete it. Participants were asked to seal the completed questionnaire in a prepaid envelope and to mail it back to the moderator whose

address was specified on the prepaid envelope. One graduate from each condition (TC + MI or TC only) declined to complete the T3 questionnaire.

Results

Due to the multiple comparisons conducted and to reduce the likelihood of a Type 1 error, the Bonferroni correction was employed, adjusting the significance level to 0.004 for all of the following analyses.

Attrition analysis

Independent sample t-tests were conducted with all variables at T1 and T2 to determine whether there were any significant differences at the outset and early stages of treatment between those participants who completed the treatment programme and those who dropped out.

Comparison Group. At T1, while there were no significant differences between dropouts (N=25) and graduates (N=4) at admission, there was a trend for completers to report higher levels of social self-efficacy compared to graduates, t(27)=2.55, p=.017. At T2, no significant differences were revealed between graduates (N=4) and dropouts (N=10).

Treatment Group. At T1, two significant differences between dropouts (N=22) and graduates (N=10) were observed. Dropouts were significantly more amotivated towards treatment, t(30)=-3.25, p<.004, and felt less rapport with their therapists, t(24)=3.31, p<.004. There was also a trend for dropouts to be less likely to view their lives as purposeful, t(30)=2.36, p<.05. Dropouts tended to be less likely to have a learning goal orientation towards treatment, t(29)=2.10, p<.05, and to perceive themselves as socially integrated, t(30)=2.13, p<.05. While, at T2, no significant differences were observed between completers (N=9) and dropouts (N=6), there was a trend for completers to report higher levels of identified motivation, t(13)=3.20, p=.007, and to be more likely to view their life as meaningful, t(13)=2.20, p=.049.

Retention

Hypothesis 1 stated that the MI-integrated treatment would be more effective than standard treatment in retaining clients through the initial stages of treatment. This hypothesis was not supported. Fifteen (51.7%) of the twenty-nine comparison participants and seventeen (53.1%) of the thirty-two treatment participants dropped out during the first two months of treatment, failing to reveal any significant difference between the two groups in terms of retention during the initial stages of the therapeutic process.

Hypothesis 2 was supported, demonstrating that the MI-integrated approach was more effective than the standard treatment in retaining clients until graduation. Nine (31.1%) treatment participants graduated from the programme compared to four (13.8%) comparison participants. However, due to the small

ample size it was not possible to assess whether the observed differences between the two groups were statistically significant. Treatment participants also spent, on average, more time in treatment (N=105.09 days; SD=72.65) compared to participants in the comparison condition (N=89.17 days; SD=68.40), but this difference was not statistically significant, t(59)=-.879; p=.383.

Motivation for treatment

Participants were assigned to one of the six motivational types (i.e. intrinsic, integrated, identified, introjected, external and amotivation) at T1, T2, and T3 based on their category with the highest score (see Table 2).

Table 2: Percentage and frequency data for participants' motivation for treatment at treatment admission (Time 1), two months in treatment (Time 2), and at treatment completion (Time 3)

	Comparison Group			Treatment Group		
	Time 1 % (freq) N=29	Time 2 % (freq) N=14	Time 3 % (freq) N=3	Time 1 % (freq) N=32	Time 2 % (freq) N=15	Time 3 % (freq) N=8
Intrinsic	10.3% (3)	7.1% (1)	-	9.4% (3)	6.7% (1)	12.5% (1)
Integrated	41.4% (12)	64.3% (9)	66.7% (2)	28.1% (9)	60.0% (9)	87.5% (7)
Identified	24.1% (7)	-	-	18.8% (6)	6.7% (1)	-
Introjected	-	-	-	-	-	-
External	24.1% (7)	21.4% (3)	33.3% (1)	31.3% (10)	13.3% (2)	-
Amotivation	-	7.1% (1)	-	12.5% (4)	13.3% (2)	-

Due to the small sample size, the assumptions for chi-square analysis were not met. Thus, it was not possible to determine whether any observed between-group differences across treatment were statistically significant. Instead, differences in percentages between the comparison and treatment conditions across the therapeutic process were compared.

Comparison Group. In line with Hypothesis 3, there was an increase of 22.9% in the proportion of clients in the integrated condition (from 41.4% to 64.3%) from T1 to T2 and a decrease of 2.7% in the proportion of clients in the external condition (from 24.1% to 21.4%). Inspection of the raw data revealed that the clients who had an identified or external motivational attitude at T1 and were still in treatment at T2 shifted to an integrated motivational attitude towards treatment across the first two months of treatment. At T3, two of the three remaining participants had an integrated motivational attitude towards treatment, while the third was externally motivated.

Treatment Group. Results for participants in the treatment condition mirrored those for individuals in the comparison condition, providing support

for Hypothesis 3. There was an increase of 37.9% in the proportion of clients in the integrated condition (from 28.1% to 60.0%) from T1 to T2 and a decrease of 20% in the proportion of clients in the external condition (from 31.3% to 13.3%). Inspection of the raw data revealed that the clients who had an identified or external motivational attitude at T1, and were still in treatment at T2, shifted to an integrated motivational attitude towards treatment across the first two months of treatment. At treatment completion, all remaining clients had assumed either an intrinsic or integrated motivational attitude towards treatment, as reflected by a 5.8% increase in the intrinsic category and a 27.5% increase in the integrated motivational category.

Group differences in treatment outcomes

Independent t-tests were conducted to identify differences in response patterns between the comparison and treatment groups at admission, two months into treatment and at graduation from the programme. Results revealed no significant differences between the two groups at the start of treatment. Two months into the programme, participants in the treatment condition reported significantly higher levels of social integration, $t(27)=-4.66$, $p<.004$, and were less likely to be involved with criminal peers, $t(27)=-3.16$, $p=.004$. At T2, there was also a trend for treatment participants to be less externally motivated towards treatment, $t(27)=2.97$, $p=.006$, and to report higher learning goal orientation scores, $t(23)=-2.13$, $p<.05$.

At treatment completion, participants in the treatment condition reported significantly lower levels of external motivation towards treatment compared to clients in the comparison condition, $t(9)=5.21$, $p<.004$. Furthermore, there was a trend for treatment participants to have higher learning goal orientation scores, $t(9)=-3.13$, $p<.05$, while comparison participants tended to have higher performance goal orientation, $t(9)=3.11$, $p<.05$, and avoidance goal orientation scores, $t(9)=2.67$, $p<.05$.

Within-group changes

Comparison group

T1 → T2 (N=14). Participants in the comparison condition did not experience any significant changes in any of the outcome indicators from T1 to T2. However, there was a trend for comparison clients to experience more well-being, $t(13)=-2.549$, $p=.024$, an increase in confidence to abstain from substance use, $t(13)=-2.400$, $p=.032$, and an increase in their spiritual belief as a source of strength in their recovery, $t(11)=-2.84$, $p=.016$. Contrary to expectations, the comparison participants tended to feel less socially integrated at T2 compared to T1, $t(13)=2.47$, $p=.028$.

T2 → T3 (N=3). Participants in the comparison condition did not experience any significant changes in any of the outcome indicators from T2 to T3.

T1 → T3 (N=3). Participants in the comparison condition did not experience any significant changes in any of the outcome indicators from T1 to T3, but two trends were observed: comparison participants became more confident to abstain from substance use across the therapeutic process, $t(2)=-8.31$, $p=.01$, and reported feeling more socially integrated, $t(2)=-6.93$, $p=.02$.

Treatment group

T1 → T2 (N=15). Overall, clients viewed their lives as more meaningful at T2, $t(14)=-4.17$, $p<.004$, and they experienced higher LGO scores, $t(14)=-6.04$, $p<.004$. Interestingly, from T1 to T2 they experienced a significant drop in social self-efficacy, $t(14)=3.44$, $p=.004$. There was also a trend across the first two months of treatment for participants in the treatment group to experience a drop in introjected, $t(14)=2.278$, $p=.039$, and external motivation scores, $t(14)=2.56$, $p=.022$, to feel more confident about their ability to abstain from drugs/alcohol, $t(14)=-2.35$, $p=.034$, and to report feeling more peaceful and harmonious, $t(14)=-2.92$, $p=.011$, experiencing more purpose and direction in life, $t(14)=-2.64$, $p=.020$, feeling less confused about their life and its direction, $t(14)=3.11$, $p=.008$, and finding more strength in their spiritual beliefs, $t(14)=-3.01$, $p=.009$. Finally, there was also a trend for avoidance goal orientation to decrease across this initial period of the therapeutic process, $t(14)=2.90$, $p=.012$.

T2 → T3 (N=8). Participants in the treatment condition experienced one significa nt change from T2 to T3, in that they experienced their lives as significantly more meaningful and less confusing, $t(7)=-7.48$, $p<.004$. There was also a trend for comparison clients to be less amotivated towards treatment, $t(7)=3.19$, $p=.015$, and to feel more socially integrated, $t(7)=-2.69$, $p=.031$. Contrary to expectations, there was also a trend to report higher performance goal orientation scores, $t(7)=-3.39$, $p=.012$.

T1 → T3 (N=8). Participants reported an increase in confidence to abstain from substance use, $t(7)=-4.38$, $p<.004$, and a decrease in performance goal orientation scores, $t(7)=-6.88$, $p<.004$. The following trends were observed: (1) a reduction in amotivation scores, $t(7)=3.97$, $p=.005$; (2) an increase in overall meaning in life, $t(7)=-2.73$, $p=.03$; (3) a greater sense of life purpose and direction, $t(7)=-3.07$, $p=.01$; (4) reduced levels of confusion about individuals' life, $t(7)=-3.19$, $p=.01$; (5) an increase in learning goal orientation scores, $t(7)=-3.91$, $p=.006$; and (6) a decrease in mixing with criminal peers, $t(7)=-2.78$, $p=.02$.

Discussion

The present study employed a quasi-experimental design to compare the effectiveness of standard drug and alcohol treatment with an MI-integrated approach for individuals with co-occurring mental health and substance use disorder. Results provided support for the usefulness of the MI-integrated

approach over standard drug and alcohol treatment in the rehabilitation of chronic substance users with comorbid conditions.

Attrition analysis suggested that dropouts in the treatment condition were significantly more likely to have an amotivated attitude towards treatment and to experience substantially less rapport with their counsellor compared to graduates. These results are in line with research suggesting that an amotivated attitude results in negative outcomes (Vallerand 1997) and that a good rapport between clients and their therapists is a vital part of the therapeutic process and increases the likelihood that treatment is effective (Joe, Simpson & Broome 1998, 1999; Joe, Simpson, Dansereau & Rowan-Szal 2001). There was also a trend for dropouts in the treatment condition to experience less purpose and direction in life and to struggle to view treatment as a learning experience and positive challenge to be mastered. The findings from a study by Nicholson et al. (1994) suggest that substance users report significantly lower levels of meaning in life. No significant differences between dropouts and treatment completers were observed for participants in the comparison condition. However, there was a trend for dropouts to report lower social self-efficacy scores. TCs resemble a miniature society where people live together in close proximity and have to interact frequently with one another. This can be a very challenging experience for individuals who lack social confidence, with dropout becoming a welcome choice to escape the social and interpersonal pressures and conflicts that characterise TCs.

While the MI-integrated approach was not more successful than standard treatment in retaining clients across the first two months of treatment (Hypothesis 1), the number of programme completers in the treatment condition was substantially higher compared to the comparison condition (Hypothesis 2). Interestingly, no significant group difference was observed in terms of retention, with participants in both conditions spending, on average, between 89 and 105 days in treatment. These results suggest that what might be important is not the actual time that substance users spend in treatment but whether or not individuals complete the therapeutic programme. In support of this argument, a number of studies have indicated that positive treatment outcomes are obtained in shorter-term TC programmes (i.e. six months and shorter: McCusker & Sorensen 1994; McCusker et al. 1995; Karson & Gesumaria 1997).

Results provided support for Hypothesis 3. Participants in both the comparison and treatment condition seemed to experience a shift to a more autonomous motivational attitude towards treatment across the therapeutic process. For individuals in the treatment condition this effect, however, seemed to be stronger. This was the case particularly at T3, with all participants classified as either intrinsically motivated or holding an integrated motivational attitude towards treatment. Comparison participants were significantly more likely to remain externally motivated, while treatment participants tended to experience a drop in introjected and external motivation and amotivation scores across the therapeutic process. These results are consistent with past research

highlighting the key role of motivation in the recovery from substance use (Lemke & Moos 2002; Neff & Zule 2002; Klag, O'Callaghan & Creed 2004).

Findings also revealed support for Hypothesis 4. No significant difference between the two groups in terms of treatment outcome indicators was observed at T1. After spending two months in treatment, treatment participants, overall, felt significantly more socially integrated and were less likely to be involved with criminal peers compared to comparison participants. This is an important finding, given that time out from substance-using peers and the development of a new non-substance-using peer network is an important part in the recovery process (Spooner, Mattick & Noffs 2001) and has been found to be one of the most consistent predictors of positive treatment outcomes (Jainchill, Hawke, De Leon & Yagelka 2000). At T2 and treatment completion, there was also a trend for treatment participants to view treatment as a learning experience and to strive to increase their level of competence by adopting a mastery-orientated response pattern that is characterised by a solution-oriented focus and positive affect when faced with challenging situations (LGO). In contrast, comparison participants tended to report higher levels of performance (PGO) and avoidance goal orientation (AGO), which means that they were more concerned with how others viewed or judged their therapeutic process and avoided situations that questioned their competence and/or attracted unfavourable judgements by others. PGO and AGO have been linked to a more maladaptive and helpless response pattern that is characterised by an avoidance of challenges and a deterioration of performance in the face of obstacles. Further, these orientations have been associated with increased negative affect and a withdrawal from the difficult situation (Button et al. 1996; Payne, Youngcourt & Beaubien 2007).

With regard to within-group changes, comparison participants failed to report any significant changes in treatment outcome indicators across the therapeutic process. However, there was a trend for them to experience more wellbeing and to experience an increase in confidence to abstain from substance use. Comparison participants, like treatment participants, also tended to experience an increase in their spiritual belief as a source of strength in their recovery and came to feel more social integration.

In contrast, more positive and stronger within-group effects were observed for participants in the treatment condition. Treatment participants reported a significant increase in perceiving life as more meaningful on the whole. They reported significantly higher LGO and lower PGO scores and experienced a significant increase in confidence to abstain from substance use. Further, a trend was observed for treatment participants to mix less with criminal peers, to report lower AGO scores, to feel more peaceful and harmonious, and to experience more purpose and life direction across the therapeutic process.

On the whole, treatment outcomes were more positive and stronger for participants in the treatment condition compared to participants in the comparison group, suggesting that, as hypothesised, the MI-integrated approach is more effective than standard drug and alcohol treatment in producing positive treatment outcomes for COD clients.

Contrary to expectations for participants in both conditions, no significant effects or trends were observed in the severity of individuals' substance dependence, perceived loneliness, social self-efficacy, treatment engagement, and wellbeing. One possible explanation for the lack of effects is the small sample size, particularly at T2 and T3, making it difficult to obtain significant results.

Limitations

One limitation was the large number of variables and the comparatively small sample size, particularly at T2 and T3, due to the high degree of attrition (a common problem in this type of research), making it difficult to find significant effects and impeding the performance of some statistical analyses. The findings must be viewed with caution, given that participants were not randomly assigned to the two conditions. As a result, the observed effects may be explained by other confounding variables.

Another limitation is that the study relied on participants' self-reports, which are subject to a range of response biases, such as social desirability, misattribution, and recall biases (e.g. see Spector & Brannick 1995). However, it must be noted that self-reports are the predominant source of data for research in the addiction field (Landry, Brochu & Bergeron 2003), and that extensive evidence has been provided in support of their validity and usefulness (e.g. see Adair, Craddock, Miller & Turner 1996; Landry et al. 2003).

Future research

There is a need for the present results to be replicated, using a larger sample of COD clients. Future research should also investigate differences between the integrated MI approach employed in this study, the benefits of one or two targeted MI sessions, and the modified MI approach adapted for dual diagnosed clients that has been promoted by some researchers in relation to COD clients (see Martino et al. 2002; Carey, Leontieva, Dimmonck, Maisto & Batki 2007). Given the complexity and large number of problems that COD clients typically present with, more research is needed to identify what aspects of MI are most important in the treatment of COD clients and in what time frame and intensity they are best delivered. Future research should also look at the long-term effects of MI in producing positive treatment outcomes and sustained abstinence for this client group.

In summary, the MI-integrated treatment approach was associated with improved retention in terms of keeping clients in the programme, a more autonomous motivational attitude towards treatment, and more positive and stronger treatment outcomes, suggesting that the MI-integrated approach was more effective in the treatment of COD clients compared to standard drug and alcohol treatment.

References

Adair, E.B.G., Craddock, S.G., Miller, H.G. and Turner, C.F. (1996). Quality of treatment data: Reliability over time of self-reports given by clients in treatment for substance abuse. *Journal of Substance Abuse Treatment, 13*: 145–149.

Annis, H.M. and Martin, G. (1985). *Inventory of Drug-Taking Situations*. Toronto: Addiction Research Foundation.

Bennett, M.E. and Barnett, B. (2003). Adult psychopathology and diagnosis: Dual diagnosing. In M. Hersen and S.M. Turner (Eds.), *Adult psychopathology and diagnosis* (4th ed.) (pp. 36–71). New York: John Wiley & Sons.

Bien, T.H., Miller, W.R. and Tonigan, J.S. (1993). Brief interventions for alcohol problems: a review. *Addiction, 88*: 315–336.

Burke, B.L., Arkowitz, H. and Menchola, M. (2003). The efficacy of motivational interviewing: A meta-analysis of controlled clinical trials. *Journal of Consulting and Clinical Psychology, 71*: 843–861.

Button, S.B., Mathieu, J.E. and Zajac, D.M. (1996). Goal orientation in organizational research: A conceptual and empirical foundation. *Organizational Behavior and Human Decision Processes, 67*: 26–48.

Carey, K.B., Carey, M.P., Maisto, S.A. and Purnine, D.M. (2002). The feasibility of enhancing psychiatric outpatients' readiness to change their substance use. *Psychiatric Services, 53*: 602–608.

Carey, K.B., Leontieva, L., Dimmonck, J., Maisto, S.A. and Batki, S.L. (2007). Adapting motivational interventions for comorbid schizophrenia and alcohol use disorder. *Clinical Psychology: Science and Practice, 14*: 39–57.

Caroll, K.M. (2004). Behavioural therapies for co-occurring substance use and mood disorders. *Biological Psychiatry, 56*: 778–784.

De Leon, G. (1999). Therapeutic communities. In M. Galanter and H.D. Kleber (Eds.), *Textbook of substance abuse treatment* (2nd ed.) (pp. 447–462). Washington, DC: The American Psychiatric Press.

Donovan, D.M., Rosengren, D.B., Downey, L., Cox, G.C. and Sloan, K.L. (2001). Attrition prevention with individuals awaiting publicly funded drug treatment. *Addiction, 96*: 1149–1160.

Dunn, C., Deroo, I. and Rivara, F.P. (2001). The use of brief interventions adapted from motivational interviewing across behavioral domains: A systematic review. *Addiction, 96*: 1725–1742.

Goldberg, D. (1978). *GHQ-12*. London: NFER-Nelson Publishing Co. Ltd.

Goldberg, D. and Williams, P. (1988). *A user's guide to the General Health Questionnaire*. Windsor, UK: NFER-Nelson Publishing Co. Ltd.

Gossop, M., Darke, S., Griffiths, P., Hando, J., Powis, B., Hall, W. and Strang, J. (1995). The severity of dependence scale (SDS): Psychometric properties of the SDS in English and Australian samples of heroin, cocaine, and amphetamine users. *Addiction, 90*: 607–614.

Graeber, D.A., Moyers, T.B., Griffith, G., Guajardo, E. and Tonigan, S. (2003). A pilot study comparing motivational interviewing and an education

intervention in patients with schizophrenia and alcohol use disorders. *Community Mental Health Journal, 39*: 189–202.

Jainchill, N., Hawke, J., De Leon, G. and Yagelka, J. (2000). Adolescents in therapeutic communities: One-year posttreatment outcomes. *Journal of Psychoactive Drugs, 32*: 81–94.

Jim, H.S., Purnell, J.Q., Richardson, S.A., Golden-Kreutz, D. and Andersen, B.L. (2006). Measuring meaning in life following cancer. *Quality of Life Research: An International Journal of Quality of Life Aspects of Treatment, Care & Rehabilitation, 15*: 1355–1371.

Joe, G.W., Broome, K.M., Rowan-Szal, G.A. and Simpson, D.D. (2002). Measuring patient attributes and engagement in treatment. *Journal of Substance Abuse Treatment, 22*: 183–196.

Joe, G.W., Simpson, J. and Broome, K. (1998). Effects of readiness for drug abuse treatment on client retention and assessment of progress. *Addiction, 93*: 1177–1190.

Joe, G.W., Simpson, D.D. and Broome, K.M. (1999). Retention and patient engagement models for different treatment modalities in DATOS. *Drug and Alcohol Dependence, 57*: 113–125.

Joe, G.W., Simpson, D.D., Dansereau, D.F. and Rowan-Szal, G.A. (2001). Relationships between counselling rapport and drug abuse treatment outcomes. *Psychiatric Services, 52*: 1223–1229.

Karson, J.S. and Gesumaria, R.V. (1997). Program description and outcome of an enhanced, six-month residential therapeutic community. In G. De Leon (Ed.), *Community as method: Therapeutic communities for special populations and special settings* (pp. 199–212). Portsmouth, NH: Greenwood Publishing Group, Westport, CT.

Klag, S. (2006). *Self-determination theory and the theory of planned behaviour applied to substance abuse treatment in a therapeutic community setting.* Unpublished doctoral dissertation. Gold Coast, Australia: Griffith University.

Klag, S., O'Callaghan, F. and Creed, P. (2004). The role and importance of motivation in the treatment of substance abuse. *Therapeutic Communities, 25*: 291–317.

Landry, M., Brochu, S. and Bergeron, J. (2003). Validity and relevance of self-report data provided by criminalized addicted persons in treatment. *Addiction Research and Theory, 11*: 415–426.

Lemke, S. and Moos, R.H. (2002). Prognosis of older patients in mixed-age alcoholism treatment programs. *Journal of Substance Abuse Treatment, 22*: 33–43.

Lloyd, C.F. and O'Callaghan, F.V. (1999). Hierarchical therapeutic communities: The jewel in the crown, or the poor relation among treatment approaches to chronic addiction? *Therapeutic Communities, 20*(4): 267–279.

Martino, S., Carroll, K.M., O'Malley, S.S. and Rounsaville, B.J. (2000). Motivational interviewing with psychiatrically ill substance abusing patients. *American Journal on Addictions, 9*: 88–91.

Martino, S., Carroll, K.M., Kostas, D., Perkins, J. and Rounsaville, B. (2002). Dual diagnosis motivational interviewing: A modification of motivational interviewing

for substance-abusing patients with psychotic disorders. *Journal of Substance Abuse Treatment, 23*: 297–308.

McCusker, J. and Sorensen, J.L. (1994). HIV and therapeutic communities. In F.M. Tims, G. De Leon and N. Jainchill (Eds.), *Therapeutic community: Advances in research and application* (pp. 232–258). NIDA Monograph No. 144, NIH Publication Number 94-3633. Rockville, MD: National Institute on Drug Abuse.

McCusker, J., Vickers-Lathi, M., Stoddard, A., Hindin, R., Bigelow, C., Zorn, M., Garfield, F., Frost, R., Love, C. and Lewis, B. (1995). The effectiveness of alternate planned durations of residential drug abuse treatment. *American Journal of Public Health, 85*: 1426–1429.

Miller, W.R. and Rollnick, S. (2002). *Motivational interviewing: Preparing people to change* (2nd ed.). New York: The Guilford Press.

Miller, W.R., Moyers, T.B., Ernst, D. and Amrhein, P. (2003). *Manual for the Motivational Interviewing Skill Code* (2nd ed.). Unpublished manual: University of New Mexico. Available at http://www.motivationalinterview.org/.

Miller, W.R., Sovereign, R.G. and Krege, B. (1988). Motivational interviewing with problem drinkers; II. The drinker's check-up as a preventive intervention. *Behavioral Psychotherapy, 16*: 251–268.

Monti, P.M., Colby, S.M., Barnett, N.P., Spirito, A., Rohsenow, D.J., Myers, M., Woolard, R. and Lewander, W. (1999). Brief intervention for harm reduction with alcohol-positive older adolescents in a hospital emergency department. *Journal of Consulting & Clinical Psychology, 67*: 989–994.

Neff, J.A. and Zule, W.A. (2002). Predictive validity of a measure of treatment readiness for out-of-treatment drug users: Enhancing prediction beyond demographic and drug history variables. *American Journal of Drug and Alcohol Abuse, 28*: 147–169.

Neilsen, A.L. and Scarpitti, F.R. (1997). Changing the behavior of substance abusers: Factors influencing the effectiveness of therapeutic communities. *Journal of Drug Issues, 27*: 279–298.

Nicholson, T., Higgins, W., Turner, P., James, S., Stickle, F. and Pruitt, T. (1994). The relation between meaning in life and the occurrence of drug abuse: A retrospective study. *Psychology of Addictive Behaviors, 8*: 24–28.

Pages, K.P., Russo, J.E., Wingerson, D.K., Ries, R.K., Roy-Byrne, P.P. and Cowley, D.S. (1998). Predictors and outcome of discharge against medical advice from the psychiatric unit of a general hospital. *Psychiatric Services, 49*: 1187–1192.

Payne, S.C., Youngcourt, S.S. and Beaubien, J.M. (2007). A meta-analytic examination of the goal orientation nomological net. *Journal of Applied Psychology, 92*: 128–150.

Pelletier, L.G., Tuson, K.M. and Haddad, N.K. (1997). Client motivation for therapy scale: A measure of intrinsic motivation, extrinsic motivation, and amotivation for therapy. *Journal of Personality, 68*: 414–435.

Project MATCH Research Group (1997). Matching alcoholism treatment to client heterogeneity: Project MATCH post-treatment drinking outcomes. *Journal of Studies on Alcohol, 58*: 7–29.

Raistrick, D., Bradshaw, J., Tober, G., Weiner, J., Allison, J. and Healey, C. (1994). Development of the Leeds Dependence Questionnaire (LDQ): A questionnaire to measure alcohol and opiate dependence in the context of a treatment evaluation package. *Addiction, 89*: 563-572.

Ross, S.M. and Strauss, M.A. (1997). *Social Integration Scale.* Paper presented at the Annual Meeting of the American Educational Research Association. Chicago, IL, 24-28 March 1997.

Schoener, E.P., Madeja, C.L., Henderson, M.J., Ondersma, S.J. and Janisse, J.J. (2006). Effects of motivational interviewing training on mental health therapist behavior. *Drug and Alcohol Dependence, 82*: 269-275.

Sherer, M., Madoux, J.E., Mercandante, B., Prentice-Dunn, S., Jacobs, B. and Rogers, R.W. (1982). The self-efficacy scale: Construction and validation. *Psychological Reports, 51*: 663-671.

Simpson, D.D. (2004). A conceptual framework for drug treatment process and outcomes. *Journal of Substance Abuse Treatment, 27*: 99-121.

Sklar, S.M. and Turner, N.E. (1999). A brief measure for the assessment of coping self-efficacy among alcohol and other drug users. *Addiction, 94*: 723-729.

Spector, P.E. and Brannick, M.T. (1995). The nature and effects of method variance in organizational research. In C.L. Cooper and I.T. Robertson (Eds.), *International review of industrial and organizational psychology* (Vol. 10, pp. 249-274). New York: John Wiley & Sons Ltd.

Spooner, C., Mattick, R.P. and Noffs, W. (2001). Outcomes of a comprehensive treatment program for adolescents with a substance-use disorder. *Journal of Substance Abuse Treatment, 20*: 205-213.

Stotts, A.L., Schmitz, J.M., Rhoades, H.M. and Grabowski, J. (2001). Motivational interviewing with cocaine-dependent patients: a pilot study. *Journal of Consulting & Clinical Psychology, 69*: 858-862.

Trevyaw, T.O. and Monti, P.M. (2004). Motivational enhancement and other brief interventions for adolescent substance abuse: Foundations, applications and evaluations. *Addiction, 99*: Suppl. 2, 63-75.

Vallerand, R.J. (1997). Toward a hierarchical model of intrinsic and extrinsic motivation. In M.P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 29, pp. 271-360). San Diego: Academic.

VandeWalle, D. (2001). *Goal orientation: Advances in construct conceptualisation and validation research.* Paper presented at the 2001 SIOP National Meeting, San Diego, CA.

Vasilaki, E.I., Hosier, S.G. and Cox, W.M. (2006). The efficacy of motivational interviewing as a brief intervention for excessive drinking: a meta-analytic review. *Alcohol and Alcoholism, 41*: 328-335.

Wallace, C., Mullen, P.E. and Burgess, P. (2004). Criminal offending in schizophrenia over a 25-year period marked by deinstitutionalization and increasing prevalence of comorbid substance use disorders. *American Journal of Psychiatry, 161*: 716-727.